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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,267	10/28/2003	Jonathan K. Ross	200208250-1	4715

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INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER

WILSER, MICHAEL P

ART UNIT	PAPER NUMBER
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2195

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/695,267	Applicant(s) ROSS ET AL.	
	Examiner Michael Wilser	Art Unit 2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-19 are pending in this application.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "726" has been used to designate both dashed arrow and instruction.
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "730" has been used to designate both arrow and instruction.
4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of

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any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities: the examiner notes the use of acronyms (e.g. vmsw etc.) throughout the specification without first including a description in plain text, as required.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claim 19 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 19 is drawn to a computer readable medium, which the applicant has defined in the claim (lines 3 and 4) to encompass an electronic or optical transmission signal. The Office considers an electronic signal to be a form of energy. Energy is not a series of steps or acts and this is not a process.

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Energy is not a physical article or object and as such is not a machine or manufacture.

Energy is not a combination of substances and therefore not a compilation of matter.

Thus, an electronic transmission signal does not fall within any of the four categories of invention. Therefore, Claim 19 is not statutory.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Karger et al. (US 4,787,031).

10. As per Claim 1, Karger teaches the invention as claimed including a computer processor that executes instructions and that supports virtual machine monitor operation and implementation (abstract, lines 1-5), the computer processor comprising:

a. a virtualization-mode processor state for execution of non-virtual-machine-monitor instructions (abstract, lines 2-3);

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b. a non-virtualization-mode processor state for execution of virtual machine monitor instructions (abstract, lines 5-6); and

c. a virtualization-mode-switch instruction that switches the state the processor between virtualization-mode and non-virtualization-mode without incurring an interruption (column 20, lines 62-65).

11. As per Claim 2, Karger further discloses when executed by a process running in virtualization mode, the virtualization-mode-switch instruction checks to ensure that the page attributes of the virtual memory page containing the virtualization-mode-switch instruction are compatible with the virtualization-mode-switch instruction and that the current priority level is a most privileged virtualized priority level, before switching to non-virtualization mode (column 21, lines 5-9).

12. As per Claim 3, Karger further discloses when executed by a process running in non-virtualization mode, the virtualization-mode-switch instruction checks to ensure that the page attributes of the virtual memory page containing the virtualization-mode-switch instruction are compatible with the virtualization-mode-switch instruction and that the current priority level is a highest priority level, before switching to virtualization-mode (column 21, lines 10-15).

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13. As per Claim 4, Karger teaches the invention as claimed including a computer processor that executes instructions and that supports virtual machine monitor operation and implementation (abstract, lines 1-5), the computer processor including:

a. a virtualization-mode processor state for execution of non-virtual-machine-monitor instructions (abstract, lines 2-3);

b. a non-virtualization-mode processor state for execution of virtual machine monitor instructions (abstract, lines 5-6); and

c. a virtualization fault invoked by the computer processor when a routine executing in virtualization mode at a highest privilege level attempts to execute an instruction needing virtualization (column 5, lines 3-10).

14. As per Claim 5, Karger further discloses wherein the virtualization fault has a lower priority than improper-instruction-related faults, so that an associated virtualization-fault handler in a computer system including the computer processor can avoid emulating improper-instruction-related faults (column 18, lines 12-18).

15. As per Claim 6, Karger further discloses wherein the processor is switched to non-virtualization mode when the virtualization fault is triggered by the enhanced computer processor (column 18, lines 27-28).

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16. As per Claim 7, Karger teaches the invention as claimed including a computer processor that executes instructions and that supports virtual machine monitor operation and implementation (abstract, lines 1-5), the computer processor including:

- a. a virtualization-mode processor state for execution of non-virtual-machine-monitor instructions (abstract, lines 2-3);
- b. a non-virtualization-mode processor state for execution of virtual machine monitor instructions (abstract, lines 5-6); and
- c. a flexible highest-implemented-virtual-address bit that, in virtualization mode, is checked by the processor and reported by the virtual machine monitor to be less than the highest-implemented-virtual-address bit in non-virtualization mode, so that a high-order portion of virtual-address space is accessible only to a virtual machine monitor executing in non-virtualization mode (column 9, lines 46-50).

17. As per Claims 8-14, they are rejected for the same reasons as Claims 1-7 above.

18. As per Claim 15, Karger teaches the invention as claimed including a method for supporting multiple, concurrent guest operating systems in a computer system (column 5, lines 28-35), the method comprising:

- a. providing a virtual-mode bit flag in a processor (column 5, lines 30-35);
- b. providing a vmsw instruction in the processor that changes the state of the virtualization-mode bit flag to enable a guest operating system to directly enter virtual-machine-monitor mode without incurring an interruption (column 6, lines 1-3);

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c. providing a virtualization fault with an interruption vector, assigned to have a relatively low interruption priority, that is generated when a routine, executing at high priority in virtualization mode, attempts to execute a privileged instruction or an instruction that needs software virtualization assistance and that is associated with a virtualization fault handler (column 10, lines 52-60); and

d. providing a virtual-machine monitor that executes privileged instructions on behalf of guest operating systems and provides to each guest operating system a virtual machine interface, the virtual-machine monitor invoked by vmw instructions or a virtualization fault (column 5, lines 51-55).

19. As per Claim 16, Karger further discloses wherein address space is reserved for exclusive use by the virtual-machine monitor (column 9, lines 46-50).

20. As per Claim 17, Karger further discloses wherein the address space reserved for exclusive use by the virtual-machine monitor is addressed by addresses including a highest bit of implemented virtual address space, the virtual-machine monitor reporting a smaller implemented address space to guest operating systems addressed by addresses that do not include the highest bit of implemented virtual address space (column 9, lines 50-60).

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21. As per Claim 18, Karger further discloses computer instructions stored in a computer-readable medium that implement the virtual-machine monitor (abstract, line 1).

22. As per Claim 19, Karger further discloses computer instructions that implement the virtual-machine monitor encoded in a digital data-transfer medium including one of:

- a. an electronic data transfer medium (column 5, lines 28-35; and
- b. an optical data transfer medium (column 5, lines 28-35).

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Cota-Robles et al. (US 2003/0037089) Tracking Operating System Process and Thread Execution and Virtual Machine Execution in Hardware or in a Virtual Machine Monitor.

b. Kjos et al. (US 6,895,491) Memory Addressing for a Virtual Machine Implementation on a Computer Processor Supporting Virtual Hash-Page-Table Searching.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Wilser whose telephone number is (571) 270-1689. The examiner can normally be reached on Mon-Fri 7:30-5:00 EST (Alt Fridays Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



MPW

September 14, 2007



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